

EXERCICE 1 Calculer les dérivées des fonctions suivantes.

$$f_1(x) = 3x + 2$$

$$f_{10}(x) = x^4$$

$$f_{18}(x) = \cos x$$

$$f_2(x) = x^5$$

$$f_{11}(x) = \frac{1}{x^7}$$

$$f_{19}(x) = \frac{1}{x^5}$$

$$f_3(x) = -7x + 2$$

$$f_{12}(x) = -x$$

$$f_{20}(x) = \sqrt{x}$$

$$f_4(x) = -5x + 7$$

$$f_{13}(x) = \sin x$$

$$f_{21}(x) = \frac{1}{x^{11}}$$

$$f_5(x) = \frac{1}{x^2}$$

$$f_{14}(x) = x^7$$

$$f_{22}(x) = -7$$

$$f_6(x) = 3$$

$$f_{15}(x) = 0$$

$$f_{23}(x) = 8 + x$$

$$f_7(x) = x$$

$$f_{16}(x) = 3 - 12x$$

$$f_{24}(x) = \frac{1}{x}$$

$$f_8(x) = -x + 5$$

$$f_{17}(x) = \frac{1}{x^3}$$

$$f_9(x) = 5x - 5$$

EXERCICE 2 Calculer les dérivées des fonctions suivantes.

$$f_1(x) = \frac{1}{2x + 3}$$

$$f_{11}(x) = \frac{3x - 1}{x + 4}$$

$$f_{20}(x) = \sqrt{3x + 1}$$

$$f_2(x) = \frac{1}{3x + 4}$$

$$f_{12}(x) = \frac{5x + 6}{2x - 3}$$

$$f_{21}(x) = \sqrt{5x - 2}$$

$$f_3(x) = \frac{1}{4x + 5}$$

$$f_{13}(x) = \frac{x^2}{x + 1}$$

$$f_{22}(x) = \sqrt{1 - 7x}$$

$$f_4(x) = \frac{1}{4x - 5}$$

$$f_{14}(x) = \frac{x^2 + 1}{x^2 + 2}$$

$$f_{23}(x) = \sqrt{3x^2 + 9}$$

$$f_5(x) = \frac{3}{2x + 1}$$

$$f_{15}(x) = \frac{1}{x^2 + 4x + 1}$$

$$f_{25}(x) = \cos(2x + 3)$$

$$f_6(x) = \frac{4}{2x + 3}$$

$$f_{16}(x) = \frac{2}{3x^2 - 5}$$

$$f_{26}(x) = \sin(5x - 4)$$

$$f_7(x) = \frac{2}{1 - 5x}$$

$$f_{17}(x) = \frac{8}{4 + 7x^2}$$

$$f_{27}(x) = (2x + 4)^3$$

$$f_8(x) = \frac{x + 1}{x + 2}$$

$$f_{18}(x) = \frac{(x + 1)(x + 2)}{(x + 3)(x + 4)}$$

$$f_{28}(x) = (5x - 1)^3$$

$$f_9(x) = \frac{x + 2}{x + 3}$$

$$f_{19}(x) = \frac{x^3}{x + 3}$$

$$f_{29}(x) = \frac{1}{\sqrt{x}}$$

$$f_{10}(x) = \frac{2x + 1}{x + 3}$$

$$f_{30}(x) = \sqrt{\frac{x + 2}{x - 2}}$$

EXERCICE 3 Calculer les dérivées des fonctions suivantes :

- a) $f(x) = \ln(x+1)$ donc $f'(x) =$ d) $f(x) = \ln(x^2+1)$
 b) $f(x) = \ln(2x+1)$
 c) $f(x) = \ln(3x-1)$ e) $f(x) = \ln\left(\frac{1}{x+2}\right)$

EXERCICE 4 Calculer la fonction dérivée des fonctions suivantes :

- a) $f(x) = x - 2 - \ln(x)$ h) $f(x) = \frac{1}{2}x^2 + 1 - \ln(x)$
 b) $f(x) = x \ln(x)$ i) $f(x) = \frac{1}{x} + \frac{\ln(x)}{x}$
 c) $f(x) = \frac{\ln(x)}{x}$ j) $f(x) = \left(\ln(x)\right)^5$
 d) $f(x) = \left(\ln(x)\right)^2$ k) $f(x) = \frac{\ln(x)}{x+1}$
 e) $f(x) = (x+1)\ln(x) - x$ l) $f(x) = \frac{3\ln(x)+1}{\ln(x)}$
 f) $f(x) = \ln\left(\frac{x+3}{2-x}\right)$
 g) $f(x) = 0,2x + 3 - 2,6\ln(x+2)$

EXERCICE 5 Calculer les dérivées des fonctions suivantes :

- $f_1(x) = e^{2x} + 3$ $f_4(x) = x \ln(2x+1)$ $f_7(x) = 7e^{-x/3}$
 $f_2(x) = 5e^{-x} + 3x + 4$ $f_5(x) = \frac{e^x + 1}{e^x - 1}$ $f_8(x) = \frac{1}{e^{2x+1}}$
 $f_3(x) = 2e^{5x^2}$ $f_6(x) = \ln \sqrt{1+x^2}$ $f_9(x) = (2x+1)e^{-3x}$

EXERCICE 6 Calculer les dérivées des fonctions suivantes

- a) $f(x) = (x^2 - 2x)e^x$ c) $f(x) = \frac{e^x - 1}{2e^x + 1}$ e) $f(x) = x^2 - 2(x-1)e^x$
 b) $f(x) = \frac{1}{x}e^x$ d) $f(x) = \frac{e^x}{e^x - x}$ f) $f(x) = 5e^{2x+1}$

EXERCICE 7 Calculer les dérivées des fonctions suivantes :

- a) $f(x) = \ln(x+1)$ d) $f(x) = \ln(x^2+1)$
 b) $f(x) = \ln(2x+1)$
 c) $f(x) = \ln(3x-1)$ e) $f(x) = \ln\left(\frac{1}{x+2}\right)$

EXERCICE 8 Calculer les dérivées des fonctions suivantes.

1) $f(x) = x^3 + 4x + 2$

8) $f(x) = e^{2x+2}$

2) $f(x) = (3x + 1)^2$

9) $f(x) = 7e^{3x-2}$

3) $f(x) = (-4 + x)^3$

10) $f(x) = \ln(2x + 2)$

4) $f(x) = \frac{1}{2x+1}$

11) $f(x) = \ln(3x - 2)$

5) $f(x) = \frac{3}{5x^2 - 1}$

12) $f(x) = \cos(4x + 1)$

6) $f(x) = \sqrt{7x + 1}$

13) $f(x) = 5 \sin(4x + 1)$

7) $f(x) = 2\sqrt{5 - 2x}$

14) $f(x) = x \times e^x$

EXERCICE 9 Calculer les dérivées des fonctions suivantes :

$f_1(x) = 5x^2$

$f_6(x) = 2 \ln(1 - 4x)$

$f_{10}(x) = 8e^{x^2+1}$

$f_2(x) = -3x^2$

$f_7(x) = \ln \frac{1}{x}$

$f_{11}(x) = xe^{3x}$

$f_3(x) = x^5$

$f_8(x) = 5 \ln \frac{3}{\sqrt{x}}$

$f_{12}(x) = \cos(3x)$

$f_4(x) = 7x^7$

$f_{13}(x) = 4 \sin(2x)$

$f_5(x) = \ln(2x + 1)$

$f_9(x) = e^{3x+1}$

$f_{14}(x) = \tan(x)$

EXERCICE 10 Calculer les dérivées des fonctions suivantes :

1. $f(x) = (2x - 3)^2$

2. $f(x) = \frac{1}{3x + 1}$

EXERCICE 11 On donne les dérivées, retrouver les primitives.

$f'_1(x) = 2x$

$f'_7(x) = \cos(x)$

$f'_{13}(x) = \frac{2}{2x + 1}$

$f'_2(x) = x$

$f'_8(x) = e^{3x}$

$f'_3(x) = 5x$

$f'_9(x) = e^{-2x}$

$f'_{14}(x) = \frac{3}{5x + 1}$

$f'_4(x) = x^2$

$f'_{10}(x) = 4e^{4x}$

$f'_5(x) = 6x^2 + 4x - 1$

$f'_{11}(x) = \sin(3x)$

$f'_6(x) = \sin(x)$

$f'_{12}(x) = 5 \cos(2x)$

$f'_{15}(x) = \frac{x}{x^2 + 1}$

EXERCICE 12 Déterminer les primitives des fonctions suivantes

$$f_1(x) = 3x + 1$$

$$f_5(x) = 2 \cos(4x)$$

$$f_9(x) = \frac{-5x}{3x^2 + 1}$$

$$f_2(x) = 5x^2 - x + 4$$

$$f_6(x) = \frac{2}{x}$$

$$f_{10}(x) = \frac{1}{x(x+1)}$$

$$f_3(x) = \sin(30x)$$

$$f_7(x) = \frac{2}{5x}$$

$$f_{11}(x) = \frac{1}{x^2 + 1}$$

$$f_4(x) = \cos(15x)$$

$$f_8(x) = \frac{1}{2x + 1}$$

EXERCICE 13 Donner l'expression d'une primitive F des fonctions définies par les expressions suivantes :

$$a) f(x) = \frac{6x}{3x^2 + 3}$$

$$b) f(x) = \frac{2}{2x - 3}$$

$$c) f(x) = \frac{1}{2x - 3}$$

$$d) f(x) = \frac{24x^2}{-4x^3 + 2}$$

$$e) f(x) = \frac{2x - 1}{x^2 - x + 2}$$

$$f) f(x) = 3x + 4 + \frac{1}{2x + 4}$$

$$g) f(x) = 1 + \frac{1}{x - 3} + \frac{2}{x + 2}$$

$$h) f(x) = -\frac{5}{x} + \frac{3x^2 + 2}{x^3 + 2x} - \frac{2x}{(x^2 + 3)^2}$$

EXERCICE 14 Calculer des primitives des fonctions suivantes.

$$1) f(x) = 4x + 2$$

$$8) f(x) = \frac{3x}{5x^2 + 1}$$

$$2) f(x) = 5x^3$$

$$9) f(x) = \sqrt{x}$$

$$3) f(x) = (x + 1)(x - 1)$$

$$10) f(x) = e^{2x+2}$$

$$4) f(x) = x^3 + 4x + 2$$

$$11) f(x) = 7e^{-3x}$$

$$5) f(x) = (3x + 1)^2$$

$$12) f(x) = \cos(4x + 1)$$

$$6) f(x) = (4 - x)^3$$

$$13) f(x) = 5 \sin(4x + 1)$$

$$7) f(x) = \frac{1}{2x + 1}$$

$$14) f(x) = x \times e^x$$

EXERCICE 15 Calculer les primitives des fonctions suivantes :

$$f_1(x) = 2x$$

$$f_{10}(x) = \frac{-3}{x}$$

$$f_{18}(x) = e^{2x+7}$$

$$f_2(x) = 3x$$

$$f_{11}(x) = \frac{1}{x+1}$$

$$f_{19}(x) = \frac{1}{\sqrt{x}}$$

$$f_3(x) = x^2$$

$$f_{12}(x) = \frac{2}{3x+1}$$

$$f_{20}(x) = \sqrt{x}$$

$$f_4(x) = 5x^2$$

$$f_{13}(x) = \frac{1}{x^2}$$

$$f_{21}(x) = 2 \cos(x)$$

$$f_5(x) = 3x^5$$

$$f_{14}(x) = \frac{5}{x^2}$$

$$f_{22}(x) = 5 \sin(x)$$

$$f_6(x) = (x+1)^2$$

$$f_{15}(x) = \frac{1}{(x+7)^2}$$

$$f_{23}(x) = 2 \cos(3x)$$

$$f_7(x) = (3x+1)^2$$

$$f_8(x) = 7(3x-1)^5$$

$$f_{16}(x) = e^{2x}$$

$$f_{24}(x) = \frac{1}{2} \cos(6x)$$

$$f_9(x) = \frac{1}{x}$$

$$f_{17}(x) = 5e^{-x}$$

$$f_{25}(x) = \frac{1}{\cos^2(x)}$$

EXERCICE 16 Déterminer les primitives des fonctions suivantes

1. $f(x) = x^2 - 4x + 1$

2. $f(x) = (3 - 2x)^2$

EXERCICE 17 Déterminer les primitives des fonctions suivantes

1. $f(x) = x^2 - 4x + 1$

2. $f(x) = (3 - 2x)^2$

EXERCICE 18 Déterminer la primitive F de f qui vérifie $F(1) = 2$ lorsque $f(x) = 4x^3 - 5x + 1$

EXERCICE 19 Montrer que $F(x) = 2(x-1)^3 + 2018$ est une primitive de $f(x) = 6(x-1)^2$